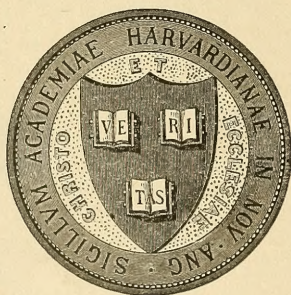


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BIRDS
BENEFICIAL TO
AGRICULTURE

BY

F. W. FROHAWK, M.B.O.U., F.E.S.



WITH 22 PLATES

LONDON

PRINTED BY ORDER OF THE TRUSTEES
OF THE BRITISH MUSEUM

1919

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BRITISH MUSEUM (NATURAL HISTORY)
ECONOMIC SERIES No. 9.

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F. W. FROHAWK, M.B.O.U., F.E.S.



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PREFACE.

THE value of the benefits conferred by Birds on Agriculture is fortunately generally admitted, and no apology is needed for efforts to facilitate the recognition of some of the best friends of the farmer, at a time when the conservation of our food-supplies is a matter of National importance. In recognition of this fact the Trustees gave instructions for the preparation of an exhibition, in the Central Hall of the Museum, of a selection of the species believed to be beneficial to Agriculture, and for the simultaneous issue of a small Guide-book, in further illustration of the subject. The work was entrusted to the well-known Naturalist and Artist, Mr. F. W. Frohawk, and his summary of the subject is given in the following pages.

The magnitude of the effect produced by Birds in the destruction of injurious Insects is illustrated by one or two of the actual exhibits, which show the entire contents of the crop or stomach of individual Birds; consisting, in the instances selected, of an enormous number of Insects which are known to be highly injurious to cultivated plants. Numerous Birds are entirely insectivorous, while many others destroy immense numbers of Insects during their nesting period, when their young are fed exclusively on food of this nature. Even the House-Sparrow, which may be injurious by consuming large quantities of corn, nourishes its young on Insects. Other species may be beneficial by eating the seeds of troublesome weeds.

It will be understood that both the exhibition and the Guide-book include merely a few of the species which might have been included, and that the selection consists of Birds which may fairly be considered beneficial. But the decision of the economic status of a given species is often a highly complex problem, as is explained by the author in his introductory remarks. It will be sufficient to point out here that a Bird such as the Starling may be beneficial under certain conditions and when not too numerous in individuals, but that if its numbers increase beyond a certain

point it may become harmful by the inadequacy of its natural food, leading it to direct its attention to other kinds of food, and thus to become injurious to Agriculture.

The specimens shown in the Exhibition-case were kindly presented by the Trustees of the late James Rowland Ward. The Plates which illustrate this work are reproduced from originals drawn for the purpose by Mr. Frohawk. Valuable suggestions have been made, during the progress of the work, by Lord Rothschild, F.R.S., the Right Hon. J. W. Lowther, D.C.L., LL.D., Speaker of the House of Commons, Mr. E. G. B. Meade-Waldo, Mr. J. C. F. Fryer, of the Board of Agriculture and Fisheries, and Mr. C. E. Fagan, I.S.O., who first suggested the preparation of the exhibit. The thanks of the Trustees are due to these and to others who have assisted in the preparation of the work.

SIDNEY F. HARMER,
Keeper of Zoology.

BRITISH MUSEUM (NATURAL HISTORY),
CROMWELL ROAD, LONDON, S.W. 7.
February 15, 1919.

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BIRDS BENEFICIAL TO AGRICULTURE.

I. BIRDS IN THEIR RELATION TO INJURIOUS INSECTS.

INSECTS of all orders form the principal food of the majority of birds, many of which are entirely insectivorous, such as the swallow, martins, swift, cuckoo, nightjar, wryneck, woodpeckers, nuthatch, tree-creeper, wren, golden-crested wren, several of the warblers, chats, redstart, wheatear and others. The wagtails, pipits, and titmice mainly feed upon insects, and the thrushes, nightingale, hedge-sparrow and the larks live mostly upon insect food. Many of the larger birds such as the buzzards, game birds, the crow family, the smaller species of gulls, small falcons and the little owl and waders, readily devour insects of all kinds, especially flies, grasshoppers, earwigs, beetles, aphides, ticks and moths. There are certain species of Lepidoptera (Butterflies and Moths) which are distasteful to birds, and others are protected from their attacks by their form and colouring. The caterpillars of the Geometrid moths are certainly to a very great extent protected by their remarkable similarity to the twigs of the plants and trees upon which they feed; and, being mostly of nocturnal habits, they pass the hours of daylight resting motionless amongst the foliage, their protective resemblance enabling them to elude the keen sight of their natural enemies.

Several species of insects are protected by their colouring, such as the gooseberry moth (*Abraxas grossulariata*), both the caterpillar and moth of which are spotted with black and yellow, possess an acrid flavour, and are usually rejected by birds. The black and yellow larvæ of the brilliantly coloured burnet and cinnabar moths are likewise distasteful to birds, on account of the acrid yellow fluid contained in their bodies; but although young pheasants (chicks) will feed upon them, the results prove fatal. The caterpillars of another very destructive species, the buff-tip moth (*Phalera bucephala*), are also usually rejected by birds, but the cuckoo feeds

largely upon them, and jays will also eat them; these larvæ are likewise mostly of black and yellow colouring, and the same applies to the brightly coloured caterpillar of the lackey moth (*Bombyx neustria*), which is striped with slaty-blue, rufous and black, one of the worst pests of orchards. Cuckoos, jays, and green woodpeckers feed upon these larvæ, and daily haunt trees infested with them. Although the Large and Small Cabbage White butterflies (*Pieris brassicæ* and *P. rapæ*) are so similar in appearance, except in size, and the larvæ of both species feed on the different varieties of cabbage and other cruciferous plants, yet the larvæ are very dissimilar in both habits and appearance. The two species also differ in the manner of egg-laying; the Large Cabbage White deposits its eggs in batches varying in number from about 40 to 100 or more in a group, usually on the underside of a leaf, but often on the upper surface, and the larvæ are gregarious, while the Small Cabbage White lays its eggs singly, generally only one or two on the same plant and invariably on the under surface only. Being solitary, this caterpillar does little harm in comparison with that of the Large White. It is uniformly green, with an inconspicuous stripe along each side composed of small yellow markings, whereas the larva of the Large White is grey-green with three conspicuous longitudinal bright yellow stripes, and the body covered with shining black points, each carrying a fine bristle. These very conspicuous caterpillars are rejected by nearly all birds, while those of the Small White are eaten readily by all.

Among the many pests destructive to agriculture the chief are wire-worms (larvæ of the click-beetles), leather-jackets (larvæ of the crane-fly or daddy-long-legs), and the grubs of the common cockchafer. All three species feed upon the roots of various plants, and without the aid of certain birds these pests would increase to such an alarming extent that they would soon completely ruin crops and lay waste the whole country. The birds which render the greatest service in keeping these pests under are the pheasant, rook, starling, lapwing and black-headed gull. The last two birds are also most beneficial in destroying immense numbers of slugs, which constitute a large proportion of their diet. Although the Little Owl (*Athene noctua*), introduced into this country over thirty years ago, is generally looked upon as destructive to game, it is undoubtedly a beneficial bird to the agriculturist, as its chief food consists of various mice and

insects ; and, as it hunts for its prey at all times during both day and night, it destroys insects of both diurnal and nocturnal habits, including crane-flies, beetles, grasshoppers, and many other noxious kinds.

Among the smaller birds there are certain species which are of the greatest value to fruit-growers ; these include the titmice, which feed largely upon such inconspicuous pests as the scale-insects and other minute hibernating species (aphides, etc.), which form a considerable portion of their winter diet, while during the summer months they consume enormous quantities of injurious larvæ. Many of the warblers regularly frequent gardens and orchards, especially during the months of August and September, in search of aphides, which apparently form their chief food in late summer and early autumn.

The principal food of the woodpeckers consists of the wood-boring larvæ such as the very destructive leopard moth (*Zeuzera æsculi*), which is so injurious to many fruit and forest trees. The handsome Greater Spotted Woodpecker feeds extensively on this particular species, and also on *Sirex* larvæ, which are harmful to fir trees by boring galleries in the solid wood.

II. BIRDS BENEFICIAL TO AGRICULTURE.

The number of birds recognised as British amounts to about 440 species, 200 of these being occasional visitors to our islands, 133 are resident species, 51 are summer visitors which breed here, and 55 are winter visitors. Of the entire list, about 120 species may be regarded as decidedly beneficial to agriculture generally. These embrace the game birds (pheasant, partridges, quail and grouse), the crakes or rails, black-headed gull, plovers, kestrel, owls, nightjar, swift, the swallows, woodpeckers, flycatchers, wrens, many of the thrush family, including song-thrush, redwing, hedge-sparrow, robin, chats, and wheatear. The warblers, shrikes, titmice, nuthatch, tree-creeper, wagtails, pipits, larks, starling and rook (the last two if kept in check), also the jackdaw, magpie and jay are beneficial to the farmer, owing to the large number of noxious insects destroyed by these birds.

Among those which do much good during the greater part of the year are some of the finches (such as the goldfinch, linnet and chaffinch) and buntings, owing to the quantity of insects devoured by these birds and their young during the nesting season, also seeds of various weeds which largely comprise their winter diet; the good done is thus greater than the harm caused in the amount of agricultural seed consumed by them. Both the starling and the rook must be looked upon as very useful birds to the agriculturist so long as their numbers are kept in check; but under the present conditions there are far too many of these birds throughout the country. The prodigious flocks occurring all over the country are far in excess of the amount of their natural food-supply, consequently they have acquired the habit of feeding on newly-sown grain; and this statement applies to both birds. The destruction of cherries by starlings is notorious, and during recent years the pear crop has suffered considerably in some districts from the attacks of the same bird. Woods in many parts of the country have been poisoned by the vast assemblages of starlings for roosting purposes. Flocks of thousands congregate in certain areas; in consequence, not only the foliage of the trees, but the entire undergrowth has been destroyed by their droppings, and the game

and other wild life of the woods have disappeared. The rook is undoubtedly an expert egg-thief, especially as regards the eggs of game and plovers. Although rooks are most useful in destroying great quantities of noxious insects, they destroy a large amount of grain.

Observations carried out in respect of the food of the rook, and published in the Transactions of the Highland and Agricultural Society of Scotland for the year 1915, show that out of 292 rooks examined, 267 contained cereals in their stomachs, 131 potato, and 203 insects; most were shot during May, many in June, several in April, and others in February, March, July, August, September and November.

The results of further investigations in connection with the food of this bird, as recorded by Dr. W. E. Collinge in his *Manual of Injurious Insects*, reveal the fact that by the examination of the stomach-contents of 830 rooks throughout the year 1908-9 in England and Wales, 67·5 per cent. of the food consisted of grain, while with the addition of fruit and roots the percentage was 71 per cent. The animal food was only 29 per cent. This is ample evidence to show that with the excessive number of rooks a grain diet is preferred. Under existing conditions the rook is not such a beneficial bird as is usually supposed; but if very much reduced in number, it would be far more useful, therefore no time should be lost in reducing them, and the same applies to starlings. Both species ought to be reduced to half their present number, which would bring about more normal conditions in respect of their habits and natural food-supply, greatly to the benefit of agriculture generally.

Jackdaws, jays and magpies are looked upon as injurious from a keeper's point of view, as they consume a certain number of the eggs and young of game-birds. The examination of the stomach-contents of a large number of these birds, which has from time to time been carried out, has proved, however, that all three are distinctly beneficial to the farmer, since the food found consisted invariably of various insects, their larvæ and pupæ, sheep-ticks, millipedes, slugs, worms, snails, rats and mice.

Although House-Sparrows do some good during the nesting season by feeding their young upon insects, especially aphides and larvæ of some of the common injurious moths and other garden pests, they are one of the most destructive of all birds in gardens.

orchards, and cornfields alike. The amount of grain devoured and spoiled by sparrows throughout the country in autumn and winter is enormous. From dissections made throughout the whole year, *corn* was found to be the chief food in each month. The insects eaten by sparrows would, in their absence, form part of the daily diet of wholly insectivorous birds which the noxious sparrow drives away. This bird is most destructive to peas, bush-fruit and orchard-trees, especially pear and other fruit buds, as well as garden plants.

Both the wood-pigeon and the stock-dove may be classed as entirely injurious to the farmer; while to the fruit-grower the bullfinch is very harmful by feeding on fruit buds. As many as 123 fruit buds (plum and damson) and numerous remains of the same have been found in the crop and gizzard of a single bullfinch, and these comprised its early morning meal.

It is often said that birds only attack buds containing grubs or some other insects. This, however, is an erroneous idea, as during the winter, when birds feed upon them, they contain no insects whatever. A few insects deposit their eggs on the smaller branches, sometimes close to the base of the bud—not *inside it*—and it is not until the expansion of the buds in spring that they are attacked by larvæ which hatch after expansion has taken place; consequently, buds that are attacked by birds during the winter months, or very early in the year, are not eaten for the sake of the grub inside, as is sometimes supposed.

The collection of birds exhibited in illustration of this subject merely represents types of familiar species which are of special benefit to agriculture, and thus require protection and encouragement throughout the British Islands. A very large number might be added, such as the warblers, pipits, larks, wagtails and others alluded to in the foregoing remarks.

PHEASANT.

Phasianus colchicus.

Although it is generally supposed that the Pheasant was introduced into this country by the Romans from the banks of the River Phases—now the Rion—in Colchis, on the shores of the Black Sea, nothing definitely is known on this point, and it appears likely that it may have been indigenous to Britain. It

retained its purity until the introduction of the Chinese Ring-necked Pheasant (*P. torquatus*) about the end of the eighteenth century, and later by the importation of the Japanese pheasant (*P. versicolor*), both of which freely interbred with *P. colchicus*, so that probably at the present time true examples of the latter are not to be found in any part of the British Islands.

The Pheasant is an omnivorous feeder ; its chief food consists of insects of all kinds, seeds, grain, berries, beech-mast, acorns, herbage, slugs and small snails ; also at times it devours mice and reptiles. Owing to the enormous numbers of injurious insects, as well as the seeds of noxious plants eaten by this bird, it is of great value to agriculture. As many as 1200 wire-worms—larvæ of the click-beetle—have been found in the crop of a single pheasant ; and 440 leather-jackets—larvæ of the daddy-long-legs or crane-fly—from another, both species being among the worst pests the farmer has to deal with. Many other instances of a similar nature have been noted. On different occasions adders have been found in pheasants' crops ; as many as eight young ones were taken from the crop of one bird.

During March the crowing of the cock birds may be heard, when they fight for possession of the hens ; and nesting begins in April. The nest is usually placed under brambles, bracken, or other shelter in woods, thickets, or amongst dense growth under hedgerows. It is slightly constructed, being a mere hollow in the ground, sparsely lined with a few leaves and grasses. The eggs number from ten to fourteen, are of an olive-brown colour, sometimes of a pale greenish-blue. When a large number of eggs occur in the same nest, they are probably the produce of two birds.

The adult male of the old English Pheasant may be distinguished by the absence of a white ring round the neck, the uniformly liver-coloured rump, and the belly of a brownish-black tinge slightly glossed with green.

COMMON PARTRIDGE.

Perdix perdix.

The Common or Grey Partridge is so well known throughout the British Islands as to need only a few remarks. It is most abundant where the land is extensively cultivated, especially in

the eastern counties. In Scotland it is local, but is common generally in the lowlands; while in Ireland it is not so plentiful as formerly. To the agriculturist the Partridge is a decidedly beneficial bird, owing to the large number of insects of various kinds which form a considerable portion of its food. It also feeds on small snails, slugs, noxious weeds, green herbage, and grain left on stubble-lands. This bird often pairs in February, but it is not until May that eggs are usually laid. The nest is a slight hollow on the ground, lined with dry grasses, roots, etc., under the shelter of coarse vegetation, hedgerows, or bushes. The eggs number from ten to fifteen, and sometimes as many as twenty, their colour being uniformly pale olive-brown.

It is generally believed that the chief distinguishing character of the sexes is the relative size of the horse-shoe mark on the breast, and that the male has it largely developed, while the female has a much smaller horse-shoe composed of a few blotches of dark chestnut feathers, or sometimes it is altogether absent. As first pointed out by Mr. W. R. Ogilvie-Grant in *The Field*, these supposed sexual characters are not to be relied upon, as the greater number of young females have a well-developed horse-shoe mark, which in some cases is quite as large as in adult males, although in Norfolk and Suffolk young females, as a rule, have only ill-defined horse-shoe markings, which are generally represented by a few dark chestnut spots on the breast, while in some birds the chestnut markings are wholly missing.

The unfailing characters whereby the sexes may readily be distinguished are as follows—adult male, the wing-coverts and scapulars are *blotched with chestnut*, and *only* the shaft-stripes are buff. The adult female has the wing-coverts and scapulars *mostly black, with buff crossbars widely separated*, in addition to the buff shaft-stripe down each feather. In adult birds the first flight-, or primary, feather is rounded at the tip, and the legs and feet are horn-grey.

Young birds of the first year have the first flight-feather pointed at the tip, and the legs and feet are yellowish-brown, which colour remains until winter, when they assume the greyish tint of the adult birds, but the *pointed* flight-feather is retained until the following autumn moult.



Corn-Grake (*Crex crex*), male.

RED-LEGGED PARTRIDGE.

Caccabis rufa.

The Red-legged Partridge, often called the French Partridge, was first introduced into this country (in Suffolk) about 1770, and has successfully and thoroughly established itself in various places, especially in the eastern counties and more particularly on the heavy clay soils. The general idea that this bird harasses and drives away the grey partridge is entirely without foundation and imaginary. Owing to the fact that the French Partridge trusts almost as much to its legs as to its wings to escape from danger, it was considered far inferior as a sporting bird in the old shooting days of walking up the game, but with the new fashion of "driving," the "red-legs" afford excellent sport and add considerably to the bag of a day's "driving."

The nest of this handsome bird is a slight hollow on the ground, lined with a few dead leaves and grasses, under the shelter of rank herbage, growing crops, or under a bush or hedgerow; the eggs vary from ten to eighteen or more. They are pale buff, speckled and blotched with rufous-brown. As its name implies this species has legs and feet, also the bill, deep red. The crown is grey; a black band passes from the base of the bill, enclosing the eye, down the side of the neck, forming a gorget, and spreading into black markings on the side of the nape and upper breast; the breast and flanks are blue-grey, the latter handsomely transversely barred with bright chestnut, black and white; belly rich fawn; upper parts olive-brown; tail chestnut. The male has blunt conical spurs or knobs on the legs (*tarsi*), which are absent in the female, otherwise the sexes are similar, except that the male is somewhat larger and more richly coloured.

The food of this bird is similar to that of the Common Partridge, and the species is consequently beneficial to agriculture.

CORN-CRAKE. (Pl. I.)

Crex crex.

This bird, also called Land-Rail, is a summer migrant, arriving in this country in April and leaving again in October, but in some of the warmer districts of the south-west, and especially in Ireland, a few remain throughout the winter months. At that season

examples have been found in Ireland in a comatose state, concealed in holes in stone walls, also in rabbit burrows.

During the nesting season it is seldom seen, but frequently heard; its well-known call, *krek, krek*, is chiefly uttered during the evening. Of recent years the Corn-Crake has greatly diminished in numbers, and it is now altogether absent from many localities where it was formerly common. The chief haunts are large open grass and clover fields, in which it remains concealed, rarely taking wing.

The nest is always placed on the ground in a slight hollow among grass, clover, or other thick herbage; it is carefully built of coarse dead grasses, leaves and bents, neatly interwoven and lined with fine grass. From nine to twelve eggs are usually laid, nine being the normal number, but occasionally as many as fourteen have been found. They vary from dull greyish-white to pale buff, and are spotted and blotched with rust-brown and underlying markings of light purplish-grey.

The food consists chiefly of insects, especially earwigs and other destructive species, slugs being also eaten.

The plumage of the upper parts is mostly of an ochreous-brown, the feathers with dark centres; wings rufous; throat whitish; breast greyish-buff; belly white; flanks barred with brown and buff; bill flesh-pink and brown along the culmen; legs and feet pale flesh-colour; irides amber-brown. The female is rather smaller than the male, and the rufous part of the wings is paler.

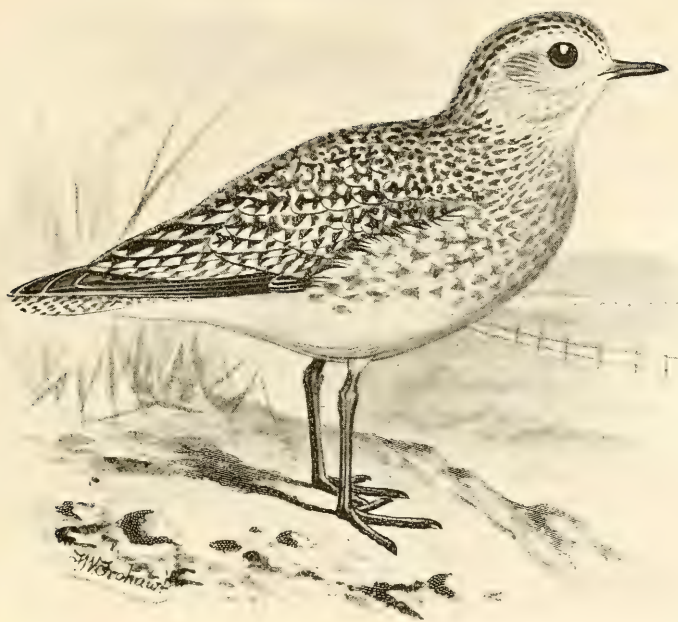
BLACK-HEADED GULL. (Pl. II.)

Larus ridibundus.

The name "black-headed" is inappropriate, as the head of this species is not black, but of a deep chocolate-brown, while other species have pure black heads. This bird, therefore, should be called the *Brown-headed* Gull. Throughout the British Islands it is common and generally distributed, both along the coasts and inland. In the spring it resorts to marshes and swamps for nesting purposes, congregating in large colonies called "gulleries." Among the most important in England are Scoulton Mere, Norfolk; Crockerham Moss, in Lancashire, and Walney Island; also Brigg, in Lincolnshire, and Aquilate Mere, in Staffordshire. Others



Black-headed Gull (*Larus ridibundus*), male, in winter plumage.



Golden Plover (*Charadrius pluvialis*), male.

exist in Cumberland and Northumberland, and there are many colonies in Scotland and Ireland.

The nest is placed among sedges, rushes, and other coarse swampy herbage, and is composed of similar growth ; the nests are frequently quite close together. The eggs number three, as a rule, but sometimes four ; they vary both in ground-colour and markings, from olive-brown to pale greenish-blue, and are occasionally pinkish in ground-tint, blotched, speckled, and streaked with dark brown and leaden-grey. During the height of the egg-laying they are collected in enormous numbers and sent to market, and in many cases sold as plovers' eggs. The collecting of the eggs for this purpose should be prohibited after the first week of May, as laying usually begins by the middle of April.

Owing to the good rendered by this bird to agriculture, it should be afforded protection in order to retain its present abundance, but it should not be allowed to become too numerous, as in the case of the rook and starling. Its food consists mainly of insects, many being caught on the wing. It destroys large numbers of very injurious species, such as cockchafers, crane-flies, saw-flies, wire-worms and moths, also worms, slugs, and seeds. Flocks of these birds commonly follow the plough and the harrow, to feed on the various grubs and worms as they are turned up. At such times they clear off great numbers of wire-worms and other pests injurious to crops.

The adult in spring has the head and throat hooded in deep chocolate-brown—which is missing in winter—white round the eye ; mantle and scapulars lavender-grey ; upper tail-coverts and tail, also under-parts, white, the latter tinged with pink ; outer primaries mostly with white tips and with margins of inner webs black ; outer web of first primary black ; bill, orbits, legs and feet crimson.

GOLDEN PLOVER. (Pl. III.)

Charadrius plumialis.

In Great Britain the Golden Plover—or Whistling Plover, as it is sometimes called—is much more plentiful and generally distributed during the autumn and winter months, owing to the very large number which arrive from August until the end of October from the Continent and more northern regions. The early arrivals

are old black-breasted birds in more or less faded dress ; during September the young birds make their appearance in large numbers, followed by the bulk of the adults in October. A return migration takes place in March.

The Golden Plover breeds on the moors throughout the British Islands, very sparingly in the southern counties of Devon, Somerset and Wales. From Derbyshire northwards it becomes more abundant, and on the moors of the northern islands it is common.

The nest is a depression in the turf, scantily lined with grass or bits of the surrounding herbage, and generally a few feathers, probably from the breast of the parent bird, rubbed off while turning round and round to smooth and shapen the depression. The eggs, four in number, are very large for the size of the bird ; they vary from pale ochreous to olive-brown in ground-colour, and are handsomely spotted and blotched with purplish-grey and rich deep brown. The Golden Plover feeds on insects, slugs and worms.

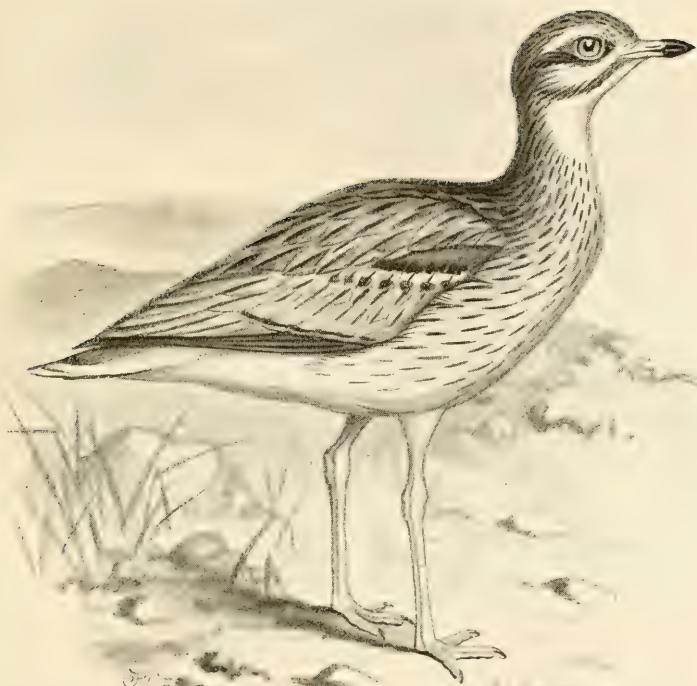
In the breeding plumage the upper parts are black, densely spotted with golden-yellow and creamy-white ; a white band passes from the forehead over the eye, down the side of the neck, breast, and flank, extending to the white under tail-coverts ; the ear-coverts, throat, and breast are black ; bill black ; legs and feet bluish-grey ; irides brown.

The female has rather less black on the breast. In winter all the black of the face, throat, and breast is replaced by white.

LAPWING, OR PEEWIT.

Vanellus vanellus.

The Lapwing, also commonly called Peewit or Green Plover, is of general distribution throughout the British Islands ; it is especially abundant in Scotland and Ireland. In autumn large numbers arrive from the Continent, when they assemble in flocks, which increase in number during the winter and disperse at the approach of spring for nesting purposes, which usually begin in April ; the favourite breeding haunts are marshes, rough pasture and fallow lands. The nest is a slight hollow lined with a few bents. The eggs almost invariably number four, but five are



Stone-Curlew (*Edicnemus edicnemus*), male.

occasionally laid. They vary much in colour, from greenish-olive to pale ochreous and sometimes light blue-grey; they are spotted and blotched with brownish-black. At the approach of danger the female runs off the nest for some distance before taking flight, and the male bird flies round the intruder, going through an extraordinary aerial performance accompanied with incessant cries.

The farmer has no better friend than the Lapwing, as its food chiefly comprises injurious insects and their larvæ, such as leather-jackets and wire-worms, also slugs and worms.

The adult male has the crown and long erectile crest green-black; back and wings metallic olive-green, glossed with purple and bronze; tail white, with a broad sub-terminal black band; nape and side of head white; chin, throat and upper breast blue-black; lower breast and belly white; both upper and under tail-coverts chestnut; bill olive-black; legs and feet lilac-pink; claws black; irides dark brown.

The sexes may be readily distinguished by the great difference in the shape of the wings. The primaries of the male, when extended, form a rounded paddle-shaped outline, while the secondaries are much shorter. The expanded wing of the female forms a continuous line, as the primaries are much shorter, giving the wing a comparatively narrow appearance. In the male the first primary equals the seventh, while in the female the first and fourth are equal in length. The male has the crest much longer and the bill shorter than the female.

The wings are so dissimilar in shape that the sexes may be readily noted while a flock of these birds pass overhead; in fact, they can be always identified when on the wing, as the great difference is so apparent.

STONE-CURLEW. (Pl. IV.)

Edicnemus edicnemus.

The Stone-Curlew, also known as the Thick-Knee or Norfolk Plover, usually arrives in this country in April and departs again in October, but during mild winters a few remain in the warmer districts. It is locally distributed over the southern and eastern counties, as far north as Yorkshire on suitable chalk wolds, heaths, and sandy soils. In Scotland it is extremely rare, and in Ireland less than a dozen examples have been noted.

The nest is a slight depression in the ground, in which the two eggs are laid; they are pale clay-colour, streaked, scrolled, and spotted with ash-grey and dark brown.

In its habits the Stone-Curlew is chiefly nocturnal, its food consisting of insects, snails, slugs and worms. It also feeds on field mice, frogs and lizards. At night, when large numbers of injurious creatures are on the move, such as earwigs, beetles and slugs, these form its chief diet. This bird consumes its food in great quantities, which renders it a most beneficial bird to the agriculturist.

The plumage of the upper parts is a pale sandy-drab, with a dark central streak down each feather, the wing-coverts with whitish tips forming a bar across the wing; below the eye is a broad white stripe, bordered above by a blackish stripe and below by a brown one; throat white; neck and breast buff streaked with dark brown; belly white; under tail-coverts sandy; bill, apical half black, rest lemon-yellow; irides golden; legs and feet pale yellow; claws black. The sexes are similar.

KESTREL. (Pl. V.)

Cerchneis tinnunculus.

The Kestrel—also commonly called the Wind-hover, from its habit of hovering almost motionless in the air, head to the wind—is the most plentiful of the British birds of prey, being commonly met with throughout the United Kingdom. During autumn a migration takes place from the northern parts of Britain, and numbers arrive in England from abroad.

Insects form the chief food of the Kestrel, especially beetles, including the destructive cockchafer, daddy-long-legs (*Tipula*), and grasshoppers; and it is one of the few birds which regularly catch and devour butterflies. Mice, voles and small birds, as well as lizards, frogs, and earthworms, are all readily eaten, mice and voles forming a large proportion of its diet. It hunts for its prey whilst hovering, and drops down upon its espied victim. When the Kestrel has a hungry brood to cater for, it does not hesitate to snatch up both pheasant and partridge chicks when an opportunity serves; but this is the limit of harm caused by this most useful bird, which should always be protected in the interests of agriculture.



Kestrel (*Cerchneis tinnunculus*), male.



Long-eared Owl (*Asio otus*), male.

The Kestrel does not construct its own nest, but occupies the old nest of some other large bird; that of the Carrion Crow is very frequently selected. Such nests it seldom repairs. Ledges of cliffs are commonly chosen for a site; a slight depression is scratched on the surface to receive the eggs. Crevices in quarries, ruins, church-towers, also hollow trees, are occasionally made use of. The eggs, laid in May, number from four to seven; they vary greatly in both colour and markings. The ground-colour varies from white to ochreous-red, and the markings vary from minute specks sprinkled over the surface to large blotches of different shades of purple-brown and light red, while some are marbled with lilac and purplish-red.

The adult male has the head, neck, rump and tail bluish-grey, the latter with a broad black sub-marginal band, externally bordered with white; the rest of the upper parts are rufous-buff, with small triangular black spots; breast and belly buff, the former streaked and the latter spotted with black; thighs and under tail-covert rufous-buff and unspotted; bill blue-grey; cere, legs and feet yellow; claws black; irides dark brown.

The female has the upper parts rufous, barred with black, tail narrowly banded with black, and a broad black sub-terminal band.

LONG-EARED OWL. (Pl. VI.)

Asio otus.

The Long-eared Owl is distributed over the whole of the British Islands, and in the larger fir woods it is generally common, especially so in Scotland. In the autumn large numbers migrate to this country from abroad.

This owl passes the daytime in the shade of dense fir woods and other forest trees, sitting on the base of the branches close against the trunk, when it becomes a very inconspicuous object, due to the close resemblance of its mottled plumage with the general colouring of the bark.

Unlike the Tawny Owl, this species does not hoot, and it is generally a rather silent bird; occasionally the adults utter a quacking call.

This owl feeds chiefly upon rats, mice, voles and small birds, and, being strictly nocturnal in its habits, does not molest game.

Unlike either the Barn Owl or the Tawny Owl, this bird does not nest in holes, but lays its eggs in old nests of crows, magpies, wood-pigeons and squirrel dreys. The eggs number from four to seven, four being the usual number ; they are white, slightly glossy, and elliptical in shape. As in the case of the Barn Owl, both eggs and young birds may be found in the same nest.

The plumage of the upper parts is bright rufous-buff, mottled and streaked with black, ash-grey and white ; on the head are erectile ear-tufts, $1\frac{1}{2}$ inches long, dark brown edged with orange-buff ; the facial disk is buff, with a dusky rim, and the eyes are surrounded with black ; under-parts buff, with black longitudinal streaks and transverse markings ; the legs and toes are clothed with ochreous feathers ; bill and claws dark horn-brown ; irides golden-orange. The female is rather darker and larger than the male.

SHORT-EARED OWL. (Pl. VII.)

Asio accipitrinus.

The Short-eared Owl, also called the Marsh Owl or Woodcock-Owl, is an inhabitant of the open country, frequenting fens, moors, marshes and rough grass lands, while during the autumn it is frequently found in stubble and turnip fields. Although a partially resident species and widely distributed throughout the British Islands, large numbers arrive on our east coasts from the Continent and spread over the country from October to March, reaching Ireland, where it is common during late autumn and winter, but is not known to breed there. Owing to its arrival in October at the same time as the woodcock, it has obtained the name of Woodcock Owl.

Previous to the draining of the fens, numbers used to nest there, but it now does so only in very limited numbers. In the northern counties it becomes more plentiful, and in Scotland and the adjacent islands it is common.

In the fen lands and marshes its nest is only a slight hollow in the ground, sparsely lined with a few dead grasses, which are scratched together round the eggs, while on the moors it is among the heather that the eggs are laid. They number from three to eight, and are white with a smooth surface.

The food of this owl chiefly comprises field voles and mice,



Short-eared Owl (*Asio accipitrinus*), male.

also rats, bats, birds, reptiles, fish and insects. During the four years 1888-91 in the lowlands of Scotland the common Field Vole (*Microtus agrestis*) multiplied to such an extent as to become a plague. These, being the favourite food of the Short-eared Owl, attracted great numbers of these birds, which completely cleared them off. Other similar instances in different parts of the country have been observed. Such plagues are attributed to the scarcity of owls brought about by their destruction by gamekeepers.

The upper part of the plumage of this useful bird is deep buff, blotched and streaked with dark brown; the wings and tail broadly barred with brown, the latter tipped with white; the erectile ear-tufts are short, being only about $\frac{3}{4}$ inch long; the facial disk buff, with a brown rim and feathers surrounding the eyes black; under-parts ochreous-buff, streaked longitudinally with dusky-brown; bill and claws black; irides golden-yellow; legs and toes covered with feathers. The female is slightly larger than the male.

TAWNY OWL.

Syrnium aluco.

The Tawny Owl, also known as the Wood-Owl or Hooter, is greatly persecuted by keepers, in the belief that it is destructive to game chicks, a belief not founded on fact, as may be proved by the examination of the pellets cast up of the indigestible portions of the food. This consists chiefly of rats, mice, voles, moles and insects. The result of an examination of 210 pellets—as stated in Yarrell's British Birds, Fourth Edition—revealed the remains of 6 rats, 42 mice, 296 voles, 33 shrews, 48 moles, 18 small birds, a countless number of cockchafers, and 48 other beetles, a sufficient proof of the good rendered by this owl to agriculture. The harm done to game is trifling. Undoubtedly a young partridge or rabbit may be occasionally taken, but even the harm thus caused is nothing in comparison to the good done by this most useful bird in the destruction of innumerable pests noxious to farmers and gardeners alike. The Tawny Owl's diet is also varied by earth-worms and sometimes small fish.

Although an imaginary enemy to the gamekeeper, this fine bird still holds its own, and is plentiful in the more densely wooded districts, and is generally distributed over England, Wales and

Scotland, but is not known to occur in Ireland. The hooting of the Tawny Owl is very distinct from the screech of the Barn Owl; the usual hoot is hōōō-who-who-who-hōō, the first and last syllables long drawn out.

The usual nesting sites are ancient hollow trees covered with ivy, old nests of hawks and crows, sometimes in rabbit burrows, and occasionally on the bare ground under the shelter of an overhanging fir or holly branch. Nesting begins about the middle of March. The eggs number from three to five; they are white, smooth and glossy, and almost spherical in shape.

The upper part of the plumage is ashen-grey, mottled with dark brown and with large white spots on the wings and scapulars; the tail is barred with brown; under-parts mottled with pale brown and longitudinally streaked with dark brown; facial disk very large and complete, of a greyish colour with a mottled dark brown rim; bill whitish-horn colour; irides almost black; eyelids pinkish; claws brown, and toes covered with feathers.

The female is similar to, but larger than, the male. Two forms of colouring occur, one with the plumage rufous and one greyish. The former is the type most usually met with; the grey form occurs chiefly in the eastern counties, and is supposed to be the resident form.

BARN-OWL.

Strix flammea.

This beautiful and useful bird occurs throughout the greater part of the British Islands, but becomes scarce in the north. Although resident in this country, an immigration takes place in the autumn on the east coast. The Barn Owl is perhaps the most useful of all birds to the farmer, as it is the chief enemy of rats and mice. In bygone times this was fully recognised by builders of barns, who always left an opening at one end under the roof, generally in the gable, known as the "owls' window," as an entrance for these birds to keep down the mice and rats, which form their chief food. Enormous numbers of these destructive pests are destroyed by these birds, especially when feeding their young. Lord Lilford watched a pair of Barn Owls carrying food to the nest seventeen times in half an hour.

To secure its favourite food, the Barn Owl pays nightly visits



Nightjar, or Goatsucker (*Caprimulgus europaeus*), male.

to stackyards, and regularly quarters pastures and cornfields in order to prey upon the different kinds of mice which would otherwise soon overrun the land and ruin agriculture. No bird deserves stricter protection than the Barn Owl, yet no bird has been more persecuted owing to their employment in decorating game dealers' shops, and as "fancy" birds for stuffing, or for making into fire screens; also they are shot by the ignorant because they are considered unlucky.

The call of this species is a very loud weird shriek, uttered on the wing during night-time, whence the popular name Screech Owl.

Nesting commences, as a rule, about the end of April. The sites chosen for the nest are various; under the roofs of barns, cattle-sheds and other rural buildings, crevices in cliffs, holes in trees, ivy-covered ruins, church-towers and dove-cotes are all usual places. The eggs number from three to six, sometimes eight, and as many as ten have been found. They are pure white, smooth, and without gloss. They are laid at intervals—at first two; after these are hatched, two more are produced, and again others, so that eggs, young in down, and other young nearly fledged are to be found in the same nest.

The adult has the upper parts rich golden-buff speckled with white, grey and brown; facial disk white, with brown speckled rim; the wings barred with brown, and the tail with five transverse bars; under-parts white; bill white; irides black; legs and toes covered with white hair-like feathers. The female is the larger, but otherwise the sexes are similar. A dark form occurs, having the upper parts grey, with darker markings, the facial disk buff, with a dusky rim, and the under-parts buff, with dark grey spots.

NIGHTJAR, OR GOATSUCKER. (Pl. VIII.)

Caprimulgus europæus.

This beautiful and useful bird, also known as the Goatsucker, Fern-owl, Night-hawk and Churn-owl, is the latest of our summer migrants to reach this country, seldom arriving before the middle of May, and usually leaves again in September. It occurs and is generally common in suitable localities throughout Great Britain, excepting the most northern islands, where it is only a straggler.

Heaths, moors, woodlands and commons abounding with gorse and bracken are the favourite haunts of this bird. While perching it sits lengthwise along a branch, usually selecting for the purpose an old gnarled one agreeing closely in colour and general resemblance with its own mottled plumage, rendering it most inconspicuous and affording it great protection. Often a certain branch may be used for a whole season or even for several consecutive years by the same bird.

The hawk-like appearance of the Nightjar has led to large numbers having been shot by gamekeepers, who in their ignorance, supposing it to be a hawk or owl, have looked upon this harmless bird as vermin.

The Nightjar makes no nest, merely placing its two beautiful eggs on the bare ground more or less under the shelter of some neighbouring furze, heather, or bracken. They are elliptical in shape and are white, spotted, streaked, and marbled in great variation with different shades of brown and lilac-grey.

The general colouring of its plumage is ashen-grey, beautifully mottled, streaked, and barred with dark brown and cinnamon. The male may readily be distinguished from the female by the presence of three conspicuous white spots on the wings (one on each of the first three primaries) and by similar blotches on the tips of the two outer tail-feathers.

The Nightjar is a very beneficial species, as it feeds solely on insects of various kinds, catching them on the wing during the twilight hours. It destroys enormous numbers of moths and other insects, many being harmful to forest trees and heather.

SWIFT.

Cypselus apus.

The Swift, also known as the Deviling and Screecher, possesses no song-muscles ; its only note is a piercing harsh scream. The bill is very small, but the gape is wide for capturing insects on the wing as the bird rushes through the air in its remarkably rapid flight. Its food consists entirely of insects, including aphides, beetles, flies and gnats, all captured while flying.

This curious bird is a common summer visitor to the British Islands, throughout which it is generally distributed, appearing

about the end of April or early in May, and leaving again towards the end of August or early in September, although late stragglers have been observed during October in the south-western districts.

The Swift returns year after year to the same nesting site, which is commonly under the eaves of thatched cottages, in holes and crevices in church-towers, cliffs and old ruins. The nest is composed of straw, hay, feathers and wool, glued together by a viscid saliva secreted by the bird. The two white eggs are elongated and oval.

The plumage is bronzed sooty-brown, with a greyish-white chin and throat. The bill and feet are black; the four toes are directed forwards, and well adapted for clinging, and are very small. The sexes are similar in plumage. The food consists entirely of insects captured in flight.

CUCKOO.

Cuculus canorus.

This familiar bird usually arrives in this country about the middle of April, rarely before the end of the first week. The males precede the females by a few days, and upon their arrival at once give utterance to their well-known call. The adult birds leave during August, but the young remain a month or more later, and take their departure towards the end of September or early in October for their winter home.

The Cuckoo returns to the same locality year after year, and usually selects nests of the same species of birds in which to place its eggs. The nests most frequently chosen are those of the Hedge Sparrow, Pied Wagtail, Meadow Pipit, Reed Warbler and Sedge Warbler. But many others are made use of, and as many as ninety-six species have been recorded, including such apparently unsuitable birds as the Magpie, Jay, Wood Pigeon and Little Grebe.

The female Cuckoo deposits her egg on the ground, takes it in her bill, and places it in the selected nest. From five to eight eggs are laid. The clutches from different birds vary greatly in colour and markings; they are generally more or less of a greenish or brownish-grey, blotched and freckled with darker markings, and invariably have a few small round lead-coloured spots. Sometimes they closely resemble those of the foster bird. Blue eggs

of the Cuckoo have been found in the nests of both the Hedge Sparrow and Redstart, and those in Pied Wagtails' frequently are remarkably similar to those of the Wagtail.

The young Cuckoo ejects the young of the foster parent soon after it is hatched, and if two young Cuckoos occur in the same nest, the stronger bird quickly ejects the weaker. After the young has left the nest, the foster parents are kept busy providing food for its voracious appetite ; in feeding it they perch on the shoulders of the youngster, when it turns back its head with gaping mouth to receive its meal.

The food of the Cuckoo consists entirely of insects and their larvæ, especially those of the very destructive Buff-tip moth (*Phalera bucephala*), which are but rarely eaten by any other bird ; in this alone the Cuckoo is of great service by keeping in check this most destructive species in country places, and it may be looked upon as the natural enemy of this moth. Owing to the absence of Cuckoos in suburban districts, whole avenues of trees frequently have their branches completely denuded of leaves by the larvæ of the Buff-tip.

The general resemblance of the Cuckoo to a hawk has led to its destruction by gamekeepers and others ignorant of the similarity ; and other birds are likewise deceived by its hawk-like appearance when on the wing.

The adult Cuckoo has the upper parts, throat and breast ash-grey, wings darker, tail dark ash-grey, spotted with white and with white tips ; under-parts white, barred with dusky-brown ; irides, legs and feet yellow. The sexes are similar. The young are brown above, and have a white patch on the nape, and the irides are brown.

Both sexes sometimes occur of a rich rufous-brown, resembling a female kestrel ; this form is known as *C. hepaticus*.

GREEN WOODPECKER, OR YAFFLE.

Gecinns viridis.

This handsome bird is the largest of the British woodpeckers. It is a resident species, and is distributed over the southern half of England and Wales in suitable wooded districts. In some counties it is numerous, while in other districts it is local. It is



Greater Spotted Woodpecker (*Dendrocopos major*), male.

rare in the northern counties, and in Ireland has only occurred two or three times.

The Green Woodpecker usually commences boring its nesting hole about the middle of April, various trees being selected for the purpose. The hole is bored horizontally in either a stout branch or the trunk until it reaches the centre, where a shaft is then sunk for about a foot deep, and the bottom is enlarged into a chamber for the eggs. Decayed trees are chiefly chosen for the boring. The eggs number from five to seven, and are pure white and glossy.

The food consists of insects and their larvæ, especially many destructive wood-boring species, which the bird captures hidden in crevices and under the bark of trees. It feeds also on the larvæ, which it extracts from the borings. A large number of ants and other insects which it finds on the ground are devoured. Owing to the great quantity of destructive forest insects it destroys, the Green Woodpecker is a very beneficial forest bird.

The adult has the upper parts green, blending into yellow on the rump; the crown, nape, and moustache-marking crimson; lores and cheeks black; under-parts light green-grey; the bill, legs and feet slate-grey. The female has less crimson on the head, and the moustache-marking is black.

GREATER SPOTTED WOODPECKER. (Pl. IX.)

Dendrocopus major.

The Greater Spotted Woodpecker is confined to woodlands and forests throughout England and Wales, especially where large and ancient trees abound. In the northern counties and Scotland it is rare, and in Ireland it only occasionally occurs. Although resident in this country, an autumnal migration sometimes takes place, when small flocks have been known to reach the east coasts of both England and Scotland.

The nesting habits of this bird are similar to those of the Green Woodpecker, but the present species sometimes utilises a hollow dead branch as a nesting site. The eggs are laid in an enlarged chamber at the bottom of the hole on the bare wood; they are creamy-white with a polished surface, and vary from five to eight in number.

This handsome bird has the upper parts mostly glossy black,

the forehead, ear-coverts, sides of the neck, and throat are white; the nape crimson; a black bar runs from the base of the bill and joins the black collar; scapulars white; wings barred with white; under-parts buffish-white; vent and under tail-coverts crimson; tail black, with the three outer pairs of feathers partly white; bill leaden-black; feet brown; iris crimson. The female is slightly smaller, and has no crimson on the nape.

This bird renders great service to various forest and fruit trees by destroying large numbers of wood-boring insects. Upon examination of the gizzards of these birds they have been found completely filled with the larvæ of the leopard moth (*Zeuzera æsculi*), a very destructive species. The insect food is varied in the autumn with berries, nuts, and acorns.

LESSER SPOTTED WOODPECKER. (Pl. X.)

Dendrocopus minor.

Over the southern half of England and Wales this little woodpecker is resident and somewhat commonly distributed in many localities, especially in certain districts in Middlesex, Surrey, and Kent, also in Somersetshire and other western midlands. North of Yorkshire it is very scarce, and only a few instances of its occurrence in Scotland and Ireland are recorded.

The nesting hole is frequently made in the upper branches of lofty trees, but sometimes it is situated much lower down in old fruit trees, pollard willows, or oaks. The eggs are laid at the bottom of the excavation, either on the bare wood or on a few chips; they number from five to eight, and are of a glossy white colour.

The adult bird has the forehead pale buff; crown crimson; cheeks white; nape and moustache-mark black; upper parts, including tail, black, barred broadly with white, excepting the central tail-feathers, which are wholly black; under-parts whitish-buff, flanks streaked with black; bill and feet leaden-grey; iris rufous. The female has the crown white instead of crimson. The food consists entirely of insects, chiefly many destructive wood-boring species; consequently this handsome little bird renders good service in ridding both fruit and forest trees of a great number of injurious pests.



Lesser Spotted Woodpecker (*Dendrocopus minor*), male.

SWALLOW.

Hirundo rustica.

This very familiar summer migrant is generally distributed throughout the British Islands. In the Orkneys and Shetlands it has occasionally been known to breed.

The usual time for its arrival in this country is during the first half of April, and it generally departs in October; but stragglers often remain until the first week of November, and sometimes as late as December in the more southern counties.

The primitive nesting sites of the swallow were undoubtedly eaves, which has led to its habit of selecting the interior of barns, sheds and other outbuildings, chimneys, and the habitations of man generally. The nest is usually placed on a beam or other support against a wall; it is open above and normally shaped like half a saucer or horseshoe, and it is composed of mud-pellets mixed with pieces of hay, straw or hair, with an ample lining of dried grass and feathers. The eggs usually number four to six; they are white, blotched with various shades of rufous, dark brown and grey.

The Swallow returns to the same nesting site; and often the same nest is used for two, three or more consecutive years. Birds bred and marked in this country have been captured the following winter in South Africa as far south as the Cape.

The food of the Swallow is entirely insectivorous; gnats, flies of all descriptions, May flies, and small beetles are its staple diet. Butterflies and moths, when put to flight, are also captured. It captures its prey on the wing, and drinks while skimming over the surface of a pond, also picking up aquatic insects which are resting on the water.

The Swallow is a handsome bird; its forehead and throat are chestnut-red, the upper parts and pectoral band very deep metallic-blue; wings and tail deep bronze, the feathers of the latter with a sub-marginal row of white spots on the inner webs, except the central pair; the outer pair are elongated and tapering, and as long again as the second pair; under-parts creamy-buff; under tail-coverts light chestnut; the bill and very small feet are black. The female has less chestnut on the forehead, tail streamers shorter and under-parts lighter.

HOUSE-MARTIN.

Chelidon urbica.

The Martin, also known as the House-Martin, is a common summer migrant to this country, but usually arrives about ten days later than the Swallow. About the third week of April is the normal time of its appearance. Excepting the Hebrides, it is distributed throughout the British Islands.

It may readily be distinguished from the Swallow by the conspicuous pure white rump and the absence of the long attenuated outer pair of tail-feathers. The Martin has the crown, nape and back rich, glossy blue-black, rump and under-parts white, also white feathers clothe the little legs and feet; the wings and tail are black, as also is the bill.

The nest of this familiar bird is constructed of pellets of mud, which becomes exceedingly brittle when dry, and has a lining of dried grass and generally feathers. It is usually built against the wall of a house, close up to and under the eave or other projection which forms a covering, as it is completely closed in except a small hole left at the top edge. Ledges of rocks are also used as nesting sites.

The eggs number from four to six; they are elongated and pure white.

Like the Swallow, the Martin feeds entirely upon insects captured on the wing, small flies, gnats, and other kinds. It is one of the most useful of birds by keeping in check various troublesome and injurious insects. Unfortunately the noxious House-Sparrow greatly interferes with the nesting of this beneficial bird by driving it from its nest for the purpose of making use of it for its own family.

SAND-MARTIN. (Pl. XI.)

Cotile riparia.

The Sand-Martin is the smallest of the Swallow family which visits this country, and is the earliest to arrive. The last few days of March or early in April is the usual time of its appearance, and it leaves again towards the end of August or during September. It is more local in its distribution than either the Swallow or House-Martin, owing to the more restricted situation of its nesting



Sand-Martin (*Cotile riparia*), male.



Spotted Flycatcher (*Muscicapa grisola*), male.

haunts, but it nevertheless occurs locally throughout the British Islands. It is gregarious, nesting in colonies in sand-banks, gravel-pits, cliffs, railway-cuttings, and the banks of rivers and lakes. In suitable places it often congregates in large numbers. The nest is placed at the end of a burrow excavated by the bird; the burrow varying greatly in length, from about a foot and a half to between three and four feet. The nest is made of dry grass, with an ample lining of feathers, usually white ones being selected. The eggs are pure white, and vary from four to six in number. The Sand-Martin feeds entirely on insects captured while flying. This useful little bird is easily recognised from the House-Martin by the absence of the white rump and by the greyish-brown upper parts. The wings and tail are darker brown, and the under-parts white, with a broad brown band across the breast; the bill is black, and the feet dark brown.

SPOTTED FLYCATCHER. (Pl. XII.)

Muscicapa grisola.

The Spotted Flycatcher is a summer visitor to this country, and somewhat late in its arrival, generally making its appearance early in May and leaving again about the middle of September. It is a common summer bird throughout Britain, but becoming less numerous northwards. To the Orkneys and Shetlands it is only a wanderer.

This species commonly frequents park-lands, plantations, orchards and gardens, especially in the neighbourhood of old trees. It is particularly fond of perching upon dead boughs and railings, where it rests until some flying insect makes its appearance, when it darts off, catches its prey, and returns to its perch. This performance it repeats time after time.

The nesting site of the Spotted Flycatcher varies greatly—holes in the trunks of trees and walls, on ledges of outbuildings, summer-houses and other rustic work, and very frequently upon the branches of wall-trained fruit trees. The nest is usually built exteriorly with fine twigs, grasses, moss and cobwebs, and lined with fine grass, hair, and a few feathers. The eggs usually number five, but vary from three to six. The ground-colour varies from very pale green to bluish-white, mottled with rusty-brown or pale red.

The colouring of this bird is brown above, with the crown paler, but each feather with a dark centre; the wings and tail also dark, with pale margins to the secondaries and coverts; under-parts whitish with dark longitudinal streaks on the breast and flanks. The sexes are similar in plumage. Bill dark brown; feet black.

The chief food of the Spotted Flycatcher consists of insects, a large number being pursued and captured on the wing. Flies of various species seem to form the greater portion of its diet.

WREN.

Anorthura troglodytes.

This common little bird is distributed throughout Great Britain, and is resident, but in the autumn considerable numbers arrive on the east coasts from abroad.

Although confiding and fearless during the autumn and winter, the Wren is most shy and zealous regarding its nesting site, which it is ready to forsake at the least interference. It frequently selects outbuildings and various odd places for its nest, but almost any well-concealed site appears suitable for its requirements. Ivy on buildings, trees, walls, woods with dense undergrowth, and hedges are all equally suited for nesting purposes. The nest is a large dome-shaped structure with a small hole in the side, composed of all kinds of materials, often those most suited to harmonise with the surroundings. Usually dead leaves or moss are used externally, with a soft lining of moss and feathers.

In number the eggs vary from four to six; they are white, speckled with light red. The food of this bird consists almost entirely of insects throughout the year; during the severest weather it is apparently able to find an abundance of insects of various kinds to keep itself strong and active. Woodlice, spiders, beetles, larvæ, and other insects are readily detected while hibernating in crevices of bark and other retreats by these useful little birds.

The Wren has the whole of the upper parts rufous-brown, barred with darker brown; primaries barred with pale buff; over the eye is a buffish-white streak; under-parts grey-buff, shading into a rufous tinge on the flanks, which are barred with darker brown; bill brown; feet pale brown. The female is smaller and somewhat paler.

SONG-THRUSH.

Turdus musicus.

The Song-Thrush, also known as the Mavis or the Throstle, is generally distributed throughout the British Islands, breeding as far north as the Orkneys, but being rare in the Shetlands, and not yet known to nest there. This bird is a partial migrant; a large number migrate southwards during the autumn, when a considerable number arrive on our coasts from the Continent.

It is an early breeder, nesting often commencing in March and continuing until the end of July. The bird is then not easily disturbed, and sometimes allows itself to be touched before leaving the nest. Its nest is to be found wherever suitable cover exists. It is placed at various heights from the ground, but generally not more than a few feet up, though sometimes on the ground. Favourite resorts for the nest are evergreens of all kinds, dense hawthorns, ivy covering walls and tree trunks. The nest is massive and deep, the exterior formed of grass, fine twigs, roots, etc.; the deep cup-shaped interior is substantially lined with mud, composed of the dung of cattle and rotten wood, which forms a cement-like substance made smooth and regular by the bird turning round and round in the nest while the lining is soft. The eggs vary in number from three to six, five being the normal clutch. They are clear shining greenish-blue, speckled, spotted, and blotched with purplish-black or brown-black.

The food of the Song-Thrush consists principally of snails, worms and various insects, including many injurious kinds such as leather-jackets, wire-worms, weevils and other beetles, also various caterpillars; while fruit, both wild and cultivated, form part of its diet. From its great partiality for snails—the shells of which it smashes to pieces by beating them against stones—and the large quantity of noxious insects it destroys, it is a very beneficial bird to grass land and gardens. The amount of fruit it consumes is comparatively very small.

The Song-Thrush has the upper parts olive-brown, the wing coverts tipped with rich buff, the under wing coverts golden-buff, the breast and sides orange-buff, except the throat. The under parts and sides of the head are marked with fan-shaped dark brown and black spots. Bill brown, yellowish at the base of lower mandible, feet pale brown. The female is slightly smaller, and paler on the under-surface.

REDWING. (Pl. XIII.)

Turdus iliacus.

The Redwing, the smallest of the British thrushes, is a common winter visitant to these islands, arriving during the latter half of October, migrating at night, when its shrill call note may often be heard as the birds pass overhead. Although this bird is the most northerly in its range of all the thrushes, it is one of the first birds to be affected by severe frost. Its nesting home is Norway, Sweden, Iceland, and a little south of the Arctic Circle generally, occasionally visiting Greenland and sometimes nesting in the Faroes.

The flight of this bird is rather rapid and at times undulating, more resembling that of a skylark than of a thrush.

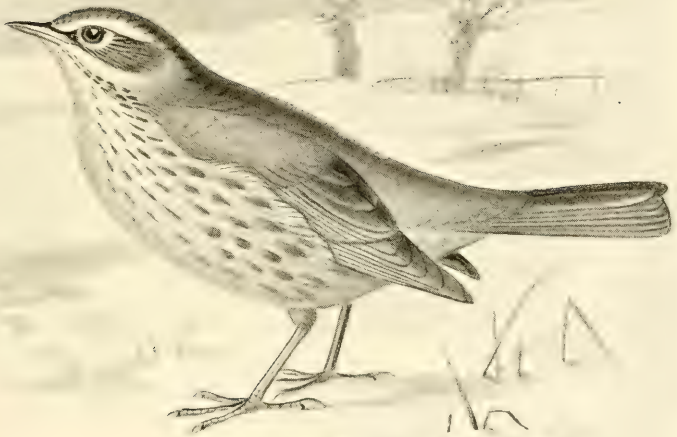
Its food consists of worms, snails, and insects, especially leather-jackets, larvæ of the daddy-long-legs (*Tipula*), a very destructive species which feeds upon the roots of various plants; these it destroys in large numbers during mild weather. In the coldest weather, when frost and snow obtain, its chief diet consists of the berries of the hawthorn. As the Redwing is only a winter visitor to Britain, when no cultivated fruit is obtainable, it is absolutely harmless to both the fruiterer and the gardener, and it is therefore entirely a beneficial bird.

This useful bird may be readily distinguished from the Song Thrush by the distinct whitish stripe over the eye and the chestnut-red colouring of the flank feathers and under wing-coverts. The sexes are almost similar in plumage, the female being somewhat duller in colour.

HEDGE-SPARROW.

Accentor modularis.

The Hedge-Sparrow is abundant and generally distributed over the whole of the British islands, excepting the more bleak and exposed northern islands. This very familiar bird is resident, but in the autumn a considerable migration from the Continent takes place, when large numbers arrive on our eastern coasts. In spring return flights occur. This bird is equally at home in gardens, shrubberies, lanes, hedge-rows, copses and woods.



Redwing (*Turdus iliacus*), male.

The well-known nest is usually built in hedges and bushes ; evergreen shrubs and hawthorns are its favourite sites. Moss, twigs, roots and dried grasses are the external materials generally used, with a lining of fibres, hair, wool and a few feathers ; green moss is freely employed in the walls of the nest. The four to six eggs are torquoise-blue.

The food consists of insects of various kinds, small worms, and seeds. The Hedge-Sparrow is a very useful garden bird.

The head and nape are ashen-grey, streaked with brown ; back rufous-brown, boldly streaked with black ; rump golden-olive ; throat and upper breast bluish-ash, lower breast and abdomen whitish ; under tail-coverts whitish-buff streaked with brown ; flanks brown with blackish-brown streaks ; bill, legs and feet brown. The female is less grey on the head and generally duller in colour.

BRITISH ROBIN, OR REDBREAST.

Erithacus melophilus.

This familiar favourite is probably better known than any other of our native birds. It is widely distributed throughout the British Islands, and breeds as far north as the Hebrides and Orkney Islands.

After the nesting season the parent birds usually drive away their young, and during the autumn, when their natural food becomes scarce, the older birds leave their wilder dwelling-places and resort to the habitations of man, where they find an additional supply of food cast from the homestead. A large number migrate to this country from more northerly regions during the autumnal months.

The nest of the Robin is ample, and is composed of dead leaves, moss, and fibres, lined with hair and feathers. It is placed in any suitable hole or other shelter, frequently on banks covered with ivy ; and out-buildings are a favourite site. The eggs number from five to seven, and are normally white, blotched and spotted with pale red. They are sometimes wholly white.

The food is chiefly insects and small worms, varied by berries and fruit during the summer and autumn months, but in winter the robin is omnivorous.

The number of insects destroyed by the Robin is far in excess

of the slight amount of fruit it devours, consequently it is an all-round beneficial species. The sexes are similar in colouring; the female differs only in having the rust-red on the head duller and that on the throat paler than the male.

WHEATEAR. (Pl. XIV.)

Saxicola oenanthe.

This bird is one of the earliest of our spring migrants, arriving in this country from its winter quarters in Northern Africa about the middle of March and departing in September. The favourite haunts of the Wheatear are open downs, warrens, uncultivated stony ground, and mountain-sides. The nest is frequently placed in a rabbit-burrow, in a stone-heap or crevice in an old wall; but peat-stacks on moorlands and similar retreats are frequently selected. Its nest is rather large, and loosely constructed of dry grasses, lined with rabbit's fur, hair and feathers. The eggs vary from five to seven in number, and are of a very pale glaucous-blue, on rare occasions very finely spotted with purplish over the larger end.

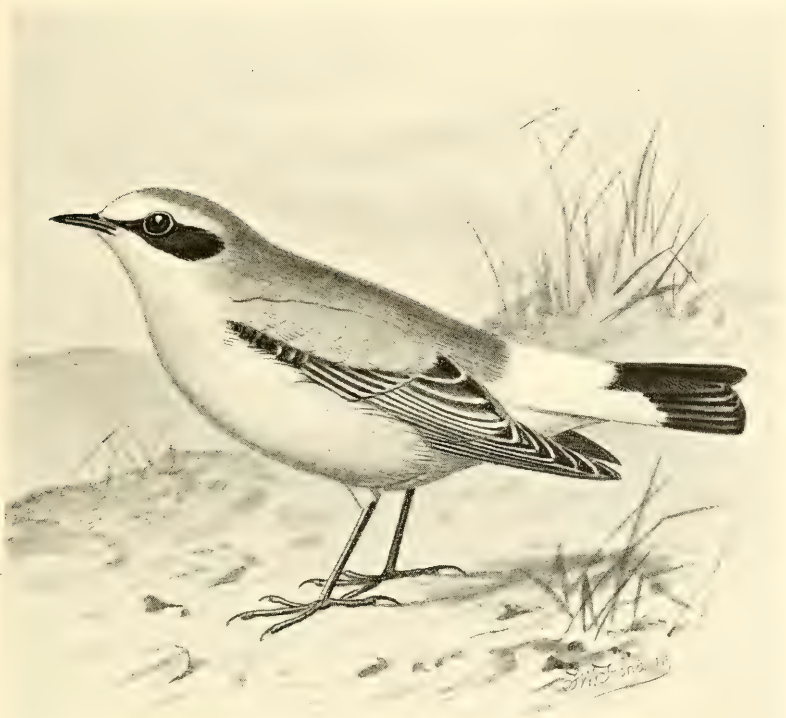
As the food of this bird is chiefly insectivorous, with the addition of small snails, it is a useful bird to the farmer. It may often be seen capturing insects on the wing, and it is similar in its actions to the spotted flycatcher.

The male is grey on the crown, neck, and back, white on the rump, the central pair of tail-feathers being black, the rest white, on the basal portion broadly tipped with black; the forehead, eye-stripe, and under-parts white; the wings chiefly black; bill, legs and feet black. The female has the ear-coverts brown (black in the male), back also brown, and the under-parts buff.

GARDEN-WARBLER. (Pl. XV.)

Sylvia hortensis.

The Garden Warbler is a summer migrant, usually arriving in this country from its winter quarters in South Africa during the first week of May, and leaving at the end of September or early in October. It is widely though locally distributed over the greater part of England, becoming rarer in the west; fairly



Wheatear (*Saxicola cinanthe*), male.



Garden-Warbler (*Sylvia hortensis*), male.



Willow-Warbler (*Phylloscopus trochilus*), male.

common in the southern counties of Scotland, and locally rare in Ireland.

Although this bird frequents shrubberies and gardens, especially on its return journey in the autumn, its chief haunts are thickets and plantations with a dense undergrowth, where its sweet and melodious song may be heard while the bird remains concealed from view, hidden by the entangled vegetation.

Its nest is frequently placed in bramble bushes and other coarse growth, also in gooseberry and currant bushes in gardens. It is formed of dried grass and roots externally, with a neat lining of hair and fine roots. The eggs number four or five; they are creamy-white or occasionally bluish-white, blotched and spotted with different shades of buffish, brown, and purplish-grey.

The food of the Garden Warbler and its young consists chiefly of insects, and to a large extent of noxious kinds, such as aphides (green fly) and the larvæ of the Small Cabbage White butterfly (*Pieris rapæ*), but those of the Large White (*P. brassicæ*) are not eaten by this bird, and probably by very few others, if any. It is during the autumn that this warbler spends much time searching for aphides among the foliage of trees and bushes in gardens and orchards, where it renders great service to the fruit-grower and gardener in destroying immense numbers of these troublesome pests. The amount of good done, therefore, is far in excess of the harm caused by the small quantity of currants with which this bird varies its diet. The whole of the upper parts are olive-brown, eye-streak paler; primary feathers darker brown, narrowly margined with pale buffish; under-parts buffish-white, duller on the flanks; legs and feet leaden-grey; bill brown. The female is slightly paler than the male.

WILLOW-WARBLER. (Pl. XVI.)

Phylloscopus trochilus.

The Willow Warbler, also called the Willow Wren, is very abundant and generally distributed over Great Britain; in Wales and the extreme south-west and also in Ireland it is locally common, and it is only an occasional visitor to the northern islands of Scotland.

This little migrant reaches the southern counties of England

about the end of March or early April, and during September departs for its winter home in Northern Africa. Woods, plantations, copses with plenty of entangled undergrowth are the chief haunts of the Willow Wren, where its cheerful song, frequently repeated, may be heard throughout April and May. It also frequents gardens and orchards on its arrival in this country, and again in the autumn before leaving, when it does a great amount of good in destroying enormous numbers of aphides (plant lice). It is during the autumn that it spends most of its time in searching for these pests on the foliage of fruit and other trees. These and other destructive insects form the chief food of this beneficial little bird.

The dome-shaped nest is generally placed among grass on the ground, and is made of moss, dried grasses, dead leaves and spider's web, with a soft lining of wool, hair, and feathers. The eggs number from four to eight, and are pure white, spotted with rust-red.

The Willow Warbler has the upper part olive-green, rump yellower, tail and wings olive-brown, the feathers narrowly margined with olive-yellow; eye-streak, tibia, and under wing-coverts pale lemon-yellow; throat, breast, and under tail-coverts yellowish; rest of under-parts whitish; bill, legs and feet brown. The sexes are similar in plumage.

GREAT TITMOUSE. (Pl. XVII.)

Parus major.

The Great Tit, also known as the Ox-eye, is commonly distributed over the British Islands, except in the north and west of Scotland, where it is rarely met with. Its chief haunts are the more wooded districts, especially plantations, orchards and gardens, where it is constantly in search of insects, which form its chief diet. The young are fed largely on caterpillars, which the parent birds collect in enormous numbers, including many noxious kinds, such as those of the common V. moth (*Halia wavaría*), which is destructive to the foliage of currant and gooseberry bushes. The Great Tit will attack, kill and devour the largest insects and their larvæ.

Holes in trees, walls and other secluded cavities are this bird's



Great Titmouse (*Parus major*), male.



British Coal Titmouse (*Parus britannicus*), male.

favourite nesting sites ; but sometimes odd situations are selected, such as letter-boxes and inverted flower-pots, also the disused nests of other birds. The nest is generally composed of dried grass and moss, with a lining of hair and feathers, the whole forming a saucer-shaped structure. The eggs are from five to eleven in number, and are pure white, spotted with deep red.

This handsome bird has the whole of the head (excepting the snow-white cheek and ear-covert) throat, collar and broad stripe down the centre of the breast and abdomen glossy blue-black ; mantle and back olive-green, shading into ashy-grey on the rump and upper tail-coverts ; wing-coverts blue-grey, the outer ones tipped with white ; primaries and secondaries brown edged with pale grey ; tail slate-grey, outer pair of feathers tipped and margined with white ; sides of breast and flanks pale sulphur-yellow ; bill black ; legs and feet leaden-grey. The female is less rich in colour, and the stripe down the breast is narrower.

BRITISH COAL TITMOUSE. (Pl. XVIII.)

Parus britannicus.

Although less abundant than either the Great Tit or Blue Tit, this little bird is generally distributed and resident throughout Britain, but it is local in Scotland, and absent from the Hebrides, Orkneys and Shetlands. Its chief haunts are fir, oak and birch woods, plantations and copses, also it is frequent in orchards and gardens. The same haunts are used for nesting purposes. The Coal Tit usually builds its nest in a hole in a tree or bank, often in the burrow of a mouse or other small mammal, and sometimes in crevices in walls. The nest is made of hair, moss and wool, with an ample lining of feathers. The eggs vary from six to ten, and are pure white, speckled with pale red.

The Coal Tit is a remarkably active little bird, incessantly in motion, searching for aphides, larvæ and various other insects, also spiders, which form its principal food. The young are fed almost entirely on caterpillars and spiders. The number of caterpillars a pair of these birds destroy during a season, in supplying their young, is enormous, and the Coal Tit is thus a most useful little bird to the fruit-grower, and should be protected and encouraged throughout the year.

The head and throat are blue-black, excepting a large conspicuous white patch extending over the side from the bill to base of neck, and a smaller white patch on the nape, which readily distinguishes this from all other British titmice; back slaty-olive, shading into olive-buff on the rump; wings and tail slaty-brown, edged with pale yellowish-olive, and secondaries tipped with white; wing-coverts with broad white tips; breast white, shading into buff on the flanks and abdomen; bill black; feet leaden-grey. The female is not so brightly coloured as the male.

BLUE TITMOUSE. (Pl. XIX.)

Parus cæruleus.

This familiar little bird is distributed generally and is common throughout Great Britain, except in the north-western districts of Scotland, where it is locally rare, and has only very occasionally occurred in the Orkneys and Shetlands. In the autumn numbers arrive on our eastern coast from abroad.

The Blue Tit selects all kinds of places for nesting purposes, but always in some hole, crevice or other cavity in trees, walls, banks, posts, and commonly in lamp-posts. The nest is usually composed of wool, hair, moss and feathers; the latter generally form a substantial lining. The eggs number from eight to ten; they are pure white, speckled with rust-red. Usually the specks are very small, but are liable to vary both in size and colour. Some are spotted with grey and rufous-brown.

The food of this bird is chiefly insects of all kinds; the number of caterpillars it destroys as food for its young is enormous. In winter it likewise feeds largely on insects which it finds secreted in the crevices of the bark of trees, and especially scale insects, which are attached to the branches of various fruit trees, also insect eggs are greedily devoured. The number of injurious insects destroyed by the Blue Tit renders it a very beneficial bird, but in early autumn it is, however, injurious to certain kinds of pears by picking holes close to the stalk.

This beautiful little bird has the crown silvery-blue, encircled by a white line extending from the white forehead; a deep indigo-blue stripe runs from the eye to the nape, where it unites with a broad band of the same colour which encircles the neck and extends along



Blue Titmouse (*Parus cæruleus*), male.



Golden-crested Wren (*Regulus cristatus*), male.

the throat to the bill, and encircling the pure white cheeks ; upper parts yellowish-green ; wings and tail blue, secondaries and coverts tipped with white ; under-parts light olivaceous-yellow ; bill leaden-black ; feet blue-grey. The female is generally duller throughout.

GOLDEN-CRESTED WREN. (Pl. XX.)

Regulus cristatus.

Although the most diminutive of all European birds, the tiny Gold Crest is a most beneficial species, as it is almost entirely insectivorous, feeding upon all kinds of insects, including a large number of minute but very destructive species.

This little bird is resident and widely distributed over the British Islands, while in the autumn the number of resident birds is enormously increased by the arrival of thousands from abroad. So great are their numbers in certain years that myriads arrive and extend throughout the entire length of the eastern coasts of both England and Scotland, and many extend their range westward to Ireland.

Well-wooded districts are its chief haunts, especially where pine, larch, and other fir trees abound, and in the winter months it may often be met with in flocks and frequently in company with long-tailed tits, regularly hunting the hedgerows in more open country in search of their insect food, which they are able to find in plenty hidden away in the crevices of the bark even during the severest and most prolonged frosts. These little birds, therefore, are doing good throughout the entire year.

Its favourite nesting-places are spruce and larch plantations. The beautifully constructed little globular nest is attached beneath a branch of fir, usually at the extremity, and is formed of moss woven together with spider's web and a few feathers and densely lined with soft feathers ; but occasionally it places its nest in ivy covering tree trunks, and sometimes in bushes. The eggs vary from five to eight, and sometimes ten in number. The ground-colour is either white or creamy-white, more or less minutely speckled with rust-red.

The Gold Crest is olive-green above, shading into yellowish on the rump ; the crown is bright yellow in front, shading into brilliant orange behind, and bordered on each side by a black

stripe ; the wing and tail feathers greyish-brown margined with olive-yellow, a blackish band across the secondaries, coverts tipped with whitish ; under-parts olive-buff. The female has a lemon-yellow crown. Bill and feet dark brown.

PIED WAGTAIL.

Motacilla lugubris.

The Pied Wagtail is common and generally distributed over the British Islands, and is partly resident, except in the extreme north of Scotland, whence a migration southwards takes place. It migrates from the south-west to the Continent in September, and returns westward in the spring.

The nest of this bird is placed in various situations, under the eaves of thatched buildings, ivy-covered trees, walls, and banks, holes in old walls, rocks, and similar retreats. The eggs vary in number from four to six, the latter being the normal number ; they are usually greyish or greenish-grey-white in ground-colour, densely speckled with dark grey or grey-brown.

The haunts of this familiar bird are varied ; marshlands, pastures, ploughed fields, uplands, gardens, banks of rivers and the neighbourhood of water generally, are all suitable resorts.

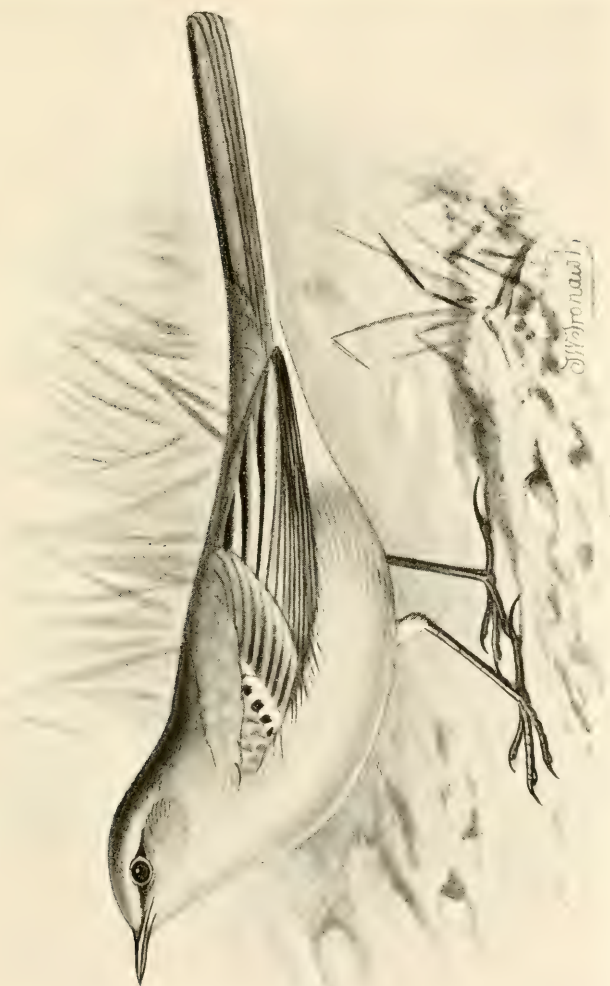
The food of the Pied Wagtail consists of all kinds of insects, spiders, centipedes, wood-lice, and other destructive pests. An enormous number of flies of many species are destroyed by this very beneficial bird.

In breeding plumage the male shows a striking contrast of colours ; the forehead, sides of the head and neck are pure white ; the crown, nape, throat and breast a rich deep black, rest of upper parts black ; secondaries and coverts margined with white, tail black except the two outer feathers, which are white ; belly white, flanks greyish-black ; bill, legs and feet black. The female has a shorter tail and the back is leaden-grey.

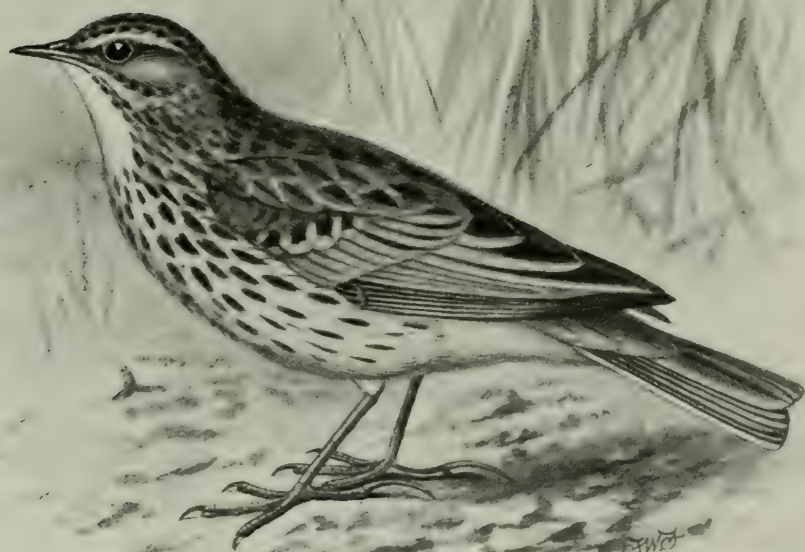
YELLOW WAGTAIL. (Pl. XXI.)

Motacilla rayi.

The Yellow, or Ray's Wagtail is a summer migrant, and is generally distributed over England and Wales in localities suited



Yellow Wagtail (*Motacilla vaghi*), male.



Meadow-Pipit (*Anthus pratensis*), male.

to its habits. In Scotland it is more local, and in Ireland only small numbers occur in certain districts.

Like the Pied Wagtail, this elegant little bird follows the plough to feed on wire-worms and other destructive larvæ in the upturned soil. It is also especially partial to grazing land, capturing the numerous flies and other insects which are disturbed by the feeding cattle.

The nest is generally placed in a depression on the ground in pastures, marshlands, or cornfields, and is well concealed among grass or other rank vegetation. It is constructed of dry grasses and roots externally, with a lining of fine roots, hair, and sometimes of moss. The eggs number four or six, and are either pale buff or dull greyish-white in ground-colour, densely mottled with brownish-buff or clay colour.

The Yellow Wagtail feeds on insects of all kinds and their larvæ, including many destructive species.

The male in breeding plumage has the upper parts yellowish-green, forehead yellower; streak over eye yellow; wings greyish-brown, secondaries and coverts margined and tipped with pale buff; tail-feathers blackish-brown, excepting the two outer pairs, which are white; under-parts bright yellow; bill, legs and feet black. The female is browner in the upper parts and less yellow below.

MEADOW-PIPIT. (Pl. XXII.)

Anthus pratensis.

This bird, also commonly known as the Titlark, is a very common species, occurring throughout the British Islands. In autumn a southward migration takes place, when many leave this country, returning again in the spring.

During the summer this species is very abundant on moorlands and other elevated districts, but it likewise occurs on pasture-land, commons, and throughout the lowlands generally.

The nest, built on the ground, is well concealed among grass, heather, and other coarse herbage. It is made of dry grasses, with a lining of fine roots and hair. The eggs number from four to six, and are usually greyish-white, sometimes tinged with greenish, and densely mottled with olive-brown, a few dark hair-lines often occurring at the larger end.

The Meadow-Pipit feeds upon insects and their larvæ,

centipedes, fresh-water molluscs and small worms, with an addition of seeds in winter when insect food is scarce.

This bird has the upper parts olive-brown, each feather with a central dark stripe; a whitish streak over the eye; wings dark brown, the primaries with yellowish margins, the secondaries and coverts margined with whitish; tail dark brown, with the outer pair of feathers half white and the second pair with a white apical spot; under-parts mostly white, the sides of the neck, breast and flanks streaked with brown-black; bill, legs and feet horn-brown, the hind claw longer than the hind toe.

SKY-LARK.

Alauda arvensis.

Throughout the United Kingdom the Sky-Lark is of general distribution, abundant and partially resident. In autumn the number of resident birds is greatly added to by enormous flocks which arrive on our shores from the Continent.

Although the Sky-Lark commonly frequents moors, heaths and uplands generally its favourite haunts are meadows and arable land, where it does a great amount of good by feeding on various noxious insects and their larvæ, and on seeds of weeds during the winter; occasionally it is destructive to generating corn, and it also feeds on small worms, centipedes and spiders. The Sky-Lark is one of the most beneficial birds to agriculture.

The nest is invariably in a depression on the ground, more or less sheltered by the side of a tussock of grass; it is rather loosely made of dried grasses and lined with finer grass-stems. The eggs vary from three to five; they have a ground-colour of greyish or buffish-white, sometimes of a greenish hue, and are usually rather densely mottled with olive-brown.

The colouring of the upper parts is golden-brown, with blackish central streaks to the feathers; over the eye is a light buffish streak; quill feathers dark brown, margined with buff and tipped with whitish; tail-feathers dark, edged with rufous-buff, outer pair mostly white, second pair with the outer webs white; under-parts buffish-white, streaked and spotted with dark brown on the throat, breast, and flanks; bill dark brown above, lighter below; feet yellowish-brown. The female is smaller and its wings shorter, but otherwise the sexes are similar.

STARLING, OR STARE.

Sturnus vulgaris.

During recent years the Starling has become generally common throughout the British Islands, having greatly increased its range in the west as well as in the north. In Ireland it is somewhat local during the breeding season, but large numbers occur there in the winter. In the autumn great flocks arrive on the east coasts and disperse over the country. In many parts of England this bird has become excessively abundant, so much so that the vast multitudes which visit certain woods and shrubberies for roosting purposes have poisoned such places by their droppings and have become a general pest.

The Starling is one of the most beneficial birds to the farmer if its numbers are kept in check, but when allowed to multiply to an unlimited extent, as it is at present, it becomes equally injurious, owing to the insufficient supply of its natural food, and it then acquires destructive habits by feeding on grain and fruit. No bird is more destructive to cherries than the Starling, which of late years has become destructive to pears.

Like rooks, Starlings should be annually thinned out, and steps immediately taken for a general reduction of their numbers throughout the country, a reduction of 40 or 50 per cent. being desirable.

The Starling, when in limited numbers, is mainly insectivorous, and it eats many of the most injurious insects, such as leather-jackets (larvæ of the crane-fly or daddy-long-legs), grubs of the cockchafer, and wire-worms, as well as other destructive kinds, also slugs, worms, and both wild and cultivated fruit, but insect food is always preferred when obtainable.

The nest of this bird is placed in almost any convenient hole it can find for the purpose, crevices in banks, cliffs or walls, in chimneys, gutter-pipes, and most commonly in holes in trees and under the roofs of houses. The nest is usually a mass of straw or grass, with more or less of a lining of wool and a few feathers. The eggs vary from four to six; they are spotless and of a pale blue colour.

The adult bird in the breeding season is handsomely coloured; the whole of the plumage is glossy black, shot with metallic green, blue and purple; the feathers of the upper parts are tipped with

buff-coloured arrow-shaped markings; the wings and tail are dark brown, with buff margins to all the feathers; the bill is lemon-yellow, and the legs and feet chestnut brown.

ROOK.

Trypanocorax frugilegus.

Throughout England, Wales and Ireland the Rook is generally distributed and abundant. In Scotland it is increasing and extending its range, and has reached the northern islands. During the autumn large numbers arrive on our eastern coasts from abroad, and a return migration takes place in the spring.

Under existing conditions there are far too many Rooks in this country; their number has so greatly multiplied during recent years that the supply of their natural food is insufficient where these birds congregate in abundance in limited areas. They have consequently to find other food, which has led to the Rook feeding upon grain, roots and fruit. It is, moreover, a great destroyer of eggs of both game and other birds, especially those of the beneficial Lapwing. Therefore, instead of it being useful to agriculture, it has become a harmful species; whereas, if greatly reduced in numbers, it would again prove beneficial, owing to its more equalised distribution and to the destruction of injurious insects and their larvæ which would result. The grain now consumed by Rooks is largely in excess of the insect food, and therefore the number of these birds should be systematically reduced. Besides the customary shooting of their young, shoots should be regularly organised so as greatly to reduce the number of the old birds.

Upon investigation of the contents of numerous gizzards of Rooks, it has been found that between 60 and 70 per cent. of their food consists of grain, such as wheat, barley, etc.; potatoes are also largely devoured.

Nest building or the repairing of old nests is commenced early in March. The nests are usually placed in the tops of tall trees, but occasionally in large bushes or pollard trees. They are strongly built of branches, twigs and turf, with a lining of roots, hay and straw. The eggs vary from three to five, and are pale blue or light green, blotched, speckled, and streaked with olive-brown.

The young are generally ready to leave their nests during the second week of May.

The adult has the forehead, lores and throat bare of feathers, the rough granulated skin being a greyish or dirty-white colour. The black plumage has a purplish-blue gloss; the bill, legs and feet are black. The female is less brilliant. The young have the base of the bill covered with black bristles, which remain until the second moult.

JACKDAW.

Colceus monedula.

The Jackdaw is commonly distributed throughout England, Wales and Ireland, and also Scotland, excepting in the north-west, where it is uncommon. It only occasionally occurs in the Shetlands; in the outer Hebrides it is unknown, but in the Orkneys it is fairly abundant. It is a resident species, but an autumnal migration takes place, when large numbers reach this country from the continent and return again in the spring. For nesting purposes the Jackdaw selects holes and crevices in cliffs, rocks, ruins, church-towers, chimneys and hollow trees; but sometimes rabbit-burrows are chosen. The nest is generally a bulky structure of sticks, straw and other litter, with a dense lining of wool, hair, feathers and other soft materials.

The eggs are usually laid at the end of April or early in May. They number from four to six and vary considerably in ground-colour, which may be pale greenish-blue, light blue or even almost white; they are spotted and blotched with black, olive-brown or lavender-grey.

As regards agriculture this bird does a large amount of good owing to the great number of noxious insects it destroys, especially such destructive pests as leather-jackets (*Tipula larvæ*), cockchafer grubs and wire-worms and also the parasites infesting sheep, as well as various other insects, worms and slugs. But it varies its diet with fruit, grain, peas, acorns, mice, eggs and young birds. As its chief food consists of insects throughout the greater part of the year it renders much benefit to agriculture.

The male Jackdaw has the upper parts glossy black, shot with purple and green reflections, the nape, ear-coverts and side of the neck ash-grey. The whole of the under parts are dull black, the bill and feet black, the iris pearl-white. The female is slightly smaller than the male and the nape is of a duller grey.

MAGPIE.

Pica pica.

The account of the Jay applies equally well to the Magpie, as regards its persecution by gamekeepers, also in its distribution; but in Ireland it is a very abundant bird, and apparently still on the increase. Although frequenting woodlands, the Magpie also haunts more open country, being commonly met with in pastures, fields and moorlands, where it may often be found in considerable flocks, searching the land for the grubs of noxious insects, slugs, and other food. It renders good service to the farmer by devouring large numbers of injurious insects and their larvæ, also snails, slugs, field mice and young rats. In the winter nuts, beech-mast, acorns and berries are also eaten. Like the Jay, it destroys eggs and game chicks when opportunities occur, but the benefit it confers on agriculture by the destruction of innumerable insects counterbalances the harm caused to the game preserve.

The large nest is generally built at some height from the ground, either in a tree or a tall thorn-hedge, but occasionally it is placed low down in bushes. It is a large structure, composed of thorny sticks fixed together with mud or clay, with a deep cup-shaped centre lined with fine roots. It is roofed over with a thorny covering, with only a narrow space between the roof and the nest proper. The eggs usually number six, but sometimes as many as nine are produced; they are either light green or creamy-white in ground-colour, densely freckled and blotched with olive-brown.

The adult is a strikingly handsome bird; the head, neck, back and breast are rich, glossy black, shot with green and purple; the rump greyish; scapulars, belly and flanks snowy-white; primaries black, glossed with green; secondaries black, glistening with purple; tail black, shot with bronze-green and purple reflections; under tail-coverts black; bill, legs and feet also black. The female is rather smaller and less brilliant in colour.

JAY.

Garrulus glandarius.

Although the Jay has been much persecuted by gamekeepers on account of its liking for eggs, it has managed, by its extreme

wariness, to hold its own, and it may be reckoned a common woodland bird, and on the increase during the last three or four years. It is widely distributed throughout England, Wales and Scotland, but in Ireland it is decidedly local, occurring only in the south and east.

From a farmer's point of view this handsome bird may be classed as beneficial, owing to the large numbers of insects it destroys, and to this fare can be added mice of different kinds which are harmful to crops, and in the autumn and winter berries, acorns, and beechmast. Upon examination the gizzards have been found to contain slugs and worms.

As an egg stealer the Jay has a bad name, but no doubt large numbers of eggs of both wood-pigeons and turtle-doves are among the species destroyed, which helps considerably to keep down these two destructive birds. The Jay is a resident in Britain, but occasionally large numbers arrive on our eastern coasts in autumn. After the breeding season Jays keep together in family parties, and take daily rounds through the woodlands. Nesting is often commenced early in the season. The nest is usually placed between 10 feet and 20 feet from the ground, and well concealed in some thick bush, often a thorn tree or other dense growth. It is strongly built of twigs externally, which are neatly interwoven internally into a deep cup-shaped centre lined with fine roots, grass and hair. The eggs number from five to seven, and very closely resemble normal eggs of the blackbird, except in being a very little larger. They are pale greenish-grey, densely mottled with light olive-brown, one or two fine black hair-lines frequently occurring on the larger end.

The adult bird has a crest of white feathers, tipped and streaked with black, covering the crown; nape and back vinous-brown; rump white; tail black, with the outer pair of feathers brown; the primary feathers black edged with white; secondaries deep rich black with large white basal patches, the innermost feather chestnut; wing-coverts alternately barred with black, white and bright silvery-blue; a black moustachial streak from the base of the bill; throat pale buff; under-parts buffish-white, blending into rufous on the flanks; bill brown; iris light blue; legs and feet brown. The sexes are similar.

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